REMARKS

Claims 1, 10 and 19 are currently amended. Claims 1-27 are pending in the application. Claims 1-2, 6-8, 10-11, 15-17, 19-20 and 24-26 stand rejected as anticipated by U.S. Patent 5,185,764 to Baier ("Baier"). Claims 3, 12 and 21 stand rejected as obvious in view of Baier and U.S. Patent Publication No. 2002/0021750 to Belotserkovsky ("Belotserkovsky). Claims 4-5, 13-14 and 22-23 stand rejected as obvious in view of Baier and U.S. Patent 6,937,648 to Raphaeli ("Raphaeli"). Finally, claims 9, 18 and 27 stand rejected as allowable, but dependent upon a rejected base claim. The applicant respectfully traverses the rejection of claims 1-8, 10-17 and 19-26, and requests reconsideration of these claims for the reasons noted below.

Claims 1-9, 10-18 and 19-27 respectively claim methods, computer program products and receivers for determining the parameters of a *parameterized* communication channel tap model, including not only calculating one or more sets of adaptively updated channel taps, but also "determining the parameters of [a] parameterized channel tap model by fitting the one or more sets of adaptively updated channel taps to a continuous function of time." The Examiner argues that Baier discloses "fitting" the parameters of the channel tap model via means 28, 29 and 31 of Fig. 2, as discussed at 4:58-66, 6:58-68 and 7:1-11. *Office Action* at p. 3. The applicant respectfully disagrees.

Figure 2 of Baier discloses a receiver whose digital signal processing functions are subdivided into three sub-functions: equalization and detection, channel estimation, and iterative channel tracking. 3:42-45. The equalization and detection sub-function is performed by an equalizer 29, which detects data symbols from a properly equalized stream of received symbols. 3:45-51. The channel estimation sub-function is performed by a channel estimator 28, which uses training data to determine the initial channel taps that are used by the equalizer 29 to correct for the dispersive characteristics of the communications channel. 3:52-68. The iterative channel tracking sub-function is performed by a channel tracker 31, which updates the channel taps in equalizer 29 based on the estimated channel impulse response as determined by the data (real or training) found in the current time slot. 4:36-47.

Baier's iterative channel tracker 31 updates the channel taps in equalizer 29 by first computing a gradient vector *e(i)*, "which indicates in which direction the channel impulse response $H_i(0)$ is to be changed," and then adding to the channel impulse response "a correction value vector which is proportional to this gradient vector." 4:58-66. Note that Baier's error vector *e(i)* is discretely calculated, once per time slot *i*, based on the difference between the data expected in that time slot (i.e., $I(i) + jQ(i)$) and the data received in that time slot (i.e., *s(i)*). 4:48-58. Thus, Baier's iterative channel tracker 31, as the name implies, does no more than track the channel taps of equalizer 29 in a discrete, iterative fashion.

By contrast, the applicant's equalizer contains a channel tap vector that can be expressed as a parameterized function of time (i.e., $h_k(t)$). For example, as shown in Eq. (3) on page 8 of the application, the channel tap vector can be a linear function of time, e.g., $h_k(t) = a_k \cdot t + h_k(0)$. The applicant then provides a way to find the parameters of this channel tap vector (i.e., the parameters a_k and $h_k(0)$). That is, the applicant discloses a method for "determining the parameters of [a] parameterized channel tap model by fitting the one or more sets of adaptively updated channel taps to a continuous function of time" as recited in claims 1-27. Clearly, Baier fails to disclose, or to even suggest, "determining the parameters of [a] parameterized channel tap model by fitting the one or more sets of adaptively updated channel taps [i.e., iteratively updated channel taps Hi(0), for $i = 1, 2, 3 \ldots$] to a continuous function of time" as required by claims 1-27. Consequently, claims 1-27 are patentable over Baier for this reason alone.

Claims 3, 12 and 21 stand rejected as obvious in view of Baier and Belotserkovsky. The Examiner relies on Baier to teach "all the subject matters claimed [in claims 1, 10 and 19] except for "running an LMS algorithm to calculate the one or more sets of adaptively updated channel taps from the one or more estimated symbols." *Office Action* at 4. The Examiner relies on Belotserkovsky to teach this limitation. Notably, the Examiner does not rely on Belotserkovsky to teach or suggest "determining the parameters of [a] parameterized channel tap model by fitting the one or more sets of adaptively updated channel taps to a continuous function of time" as recited in claims 3, 12 and 21. Nor can he, as Belotserkovsky (like Baier) teaches a conventional adaptive channel tap algorithm that is "configured to generate an initial equalizer tap setting

based on a training symbol . . . and to generate subsequent tap settings based on data symbols and an adaptive algorithm." *Belotserkovsky* at ¶ 23. In other words, Belotserkovsky also teaches generating a sequence of discretely updated channel tap settings rather than "determining the parameters of [a] parameterized channel tap model by fitting the one or more sets of adaptively updated channel taps to a continuous function of time" as recited in claims 3, 12 and 21. Consequently, claims 3, 12 and 21 are patentable over the combination of Belotserkovsky and Baier for at least this reason.

Claims 4-5, 13-14 and 22-23 stand rejected as obvious in view of Baier and Raphaeli. The Examiner relies on Baier to teach "all the subject matter claimed [in claims 1, 10 and 19], except for "fitting the one or more sets of adaptively updated channel taps to a channel tap model that is linear in time." *Office Action* at 5. The Examiner reads Raphaeli to disclose this limitation at 5:66-67 and 6:1-6, a passage which discloses the assumptions Raphaeli makes about his "iterative equalizer." The applicant respectfully disagrees.

As with the Baier and Belotserkovsky references discussed above, Raphaeli discloses a receiver having a conventional symbol equalizer. Raphaeli's equalizer is linear in the sense that it is configured to recover a data symbol $z(n)$ that is received at time n from a stream of data symbols $x(i)$ that were received at previous times $i = 0, 1, \ldots, m$, by computing a *linear* sum of the previously received data symbols $x(i)$, as weighted by the equalizer tap weights h_i (e.g., by computing the *linear* weighted sum $z(n) = \sum h_i x(i)$). This can be seen from the formula shown in Raphaeli at 9:1-13.

While Raphaeli's equalizer is thus based upon a conventional linear tap vector model, his tap vector model is not parameterized as a function time, let alone as a linear function of time. This is evident from the passage relied upon by the Examiner, which indicates that Raphaeli's equalizer is based upon the assumption that "the channel parameters are constant for the duration of the entire packet." 5:67-6:1. Since the channel parameters (taps) are constant, they are not a function of time, let alone a linear function of time. As such, Raphaeli has no need to try to determine the parameters of his channel tap model that express the variation of his channel taps with time, and thus not only fails to disclose "determining the parameters of [a] parameterized

channel tap model by fitting the one or more sets of adaptively updated channel taps to a continuous function of time," but also fails to disclose "fitting the one or more sets of adaptively updated channel taps to a channel tap model that is linear in time" as recited in claims 4-5, 13-14 and 22-23. Thus, these claims are patentable over the combination of Baier and Raphaeli for at least these reasons.

Applicant respectfully submits all claims are in condition for allowance, which action is kindly requested. No fees are believed due, however, please apply any applicable charges or credits to deposit account 06-1050.

Respectfully submitted,

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